

Amendments to the Claims

Herein, with respect to the amended claims, please note that "strikeout" matter is shown with larger-than-normal italic letters containing the strikeout horizontal marks such as in this example: ~~strikeout~~.

Here is a listing and status of the claims provided by this AMENDMENT AFTER FIRST OFFICE ACTION.

1. (Currently Amended) An apparatus for carrying out fusion of biological cells, comprising:

an inner electrode having a first electrode radius (r1) and an electrode height,

an outer electrode having a second electrode radius (r2) and said electrode height, wherein said inner electrode and said outer electrode are concentric,

a gap between said inner electrode and said outer electrode, wherein the size of said gap is the difference between said second electrode radius and said first electrode radius, and wherein a cell fusion volume is defined by said electrode height, said gap, said first electrode radius (r1), and said second electrode radius (r2), wherein said first electrode radius, said second electrode radius, and said gap are selected in accordance with a predetermined range of selectable ratios of said first electrode radius to said second electrode radius, wherein said range of selectable ratios is from 0.7 to 0.9, a selected gap limited to a range from 2 to 10 millimeters

~~by said range of selectable ratios,~~ and a determined ratio of said selectable ratios based on said selected gap, such that compression between the biological cells and permeability between cell membranes are maximized and temperature rise is minimized for providing cell fusion in said cell fusion volume.

2. (Original) The apparatus of claim 1 wherein said cell fusion volume has a volume of greater than one milliliter.

3. (Original) The apparatus of claim 1 wherein said ratio of said first electrode radius to said second electrode radius is in a range of 0.75 to 0.9.

4. (Original) The apparatus of claim 1 wherein:

said ratio of said first electrode radius to said second electrode radius is in a range of 0.8 to 0.85, and
said gap is in a range of 2 to 10 millimeters.

5. (Currently Amended) The apparatus of claim 1 wherein:

said ratio of said first electrode radius to said second electrode radius is 0.83, and
said gap is 4 millimeters.

6. (Currently Amended) A method for selecting an inner electrode, an outer electrode, and a gap between the inner electrode and the outer electrode for a cell fusion chamber for fusing biological cells, comprising the steps of:

determining two of a first electrode radius of the inner electrode, a second electrode radius of the outer

electrode, and the gap between the inner electrode and the outer electrode, wherein the gap is within a range from 2 to 10 milliliters,

setting the ratio (r_1/r_2) of the first electrode radius to the second electrode radius to a value in a range between 0.7 to 0.9, and

calculating the third of the first electrode radius of the inner electrode, the second electrode radius of the outer electrode, and the gap between the inner electrode and the outer electrode, based on the set value of the ratio, such that compression between the biological cells and permeability between cell membranes are maximized and temperature rise is minimized for providing cell fusion in the cell fusion chamber.

7. (Canceled)

8. (Canceled)

9. (Currently Amended) ~~The apparatus of claim 8~~
An apparatus for carrying out fusion of biological cells,
comprising:

a non-conductive base member,
a conductive outer electrode supported on said base member,
wherein said outer electrode includes a concave outer electrode
surface which has an outer electrode radius (r_2) and has an
electrode height,
a conductive inner electrode supported on said base member,
wherein said inner electrode includes a convex inner electrode
surface which has an inner electrode radius (r_1) and has the

electrode height, wherein said outer electrode surface and said inner electrode surface are spaced apart from each other by a gap which defines a fusion chamber,

a non-conductive outer electrode cover member supported by said outer electrode, and

a non-conductive inner electrode cover member supported by said inner electrode, wherein said outer electrode cover member and said inner electrode cover member define an access channel, wherein said access channel is in communication with said fusion chamber,

wherein:

said non-conductive outer electrode cover member includes a concave outer cover member surface which has an outer cover member radius,

said non-conductive inner electrode cover member includes a convex inner cover member surface which has an inner cover member radius, and

said outer cover member radius is equal to said outer electrode radius, and said inner cover member radius is equal to said inner electrode radius, whereby said access channel is in registration with said fusion chamber.

10. (Canceled)
11. (Canceled)
12. (Canceled)
13. (Canceled)
14. (Canceled)